

Where:

$$\text{Improvement Factor} = \frac{(\text{Fuel Consumption}_A - \text{Fuel Consumption}_B)}{(\text{Fuel Consumption}_A)}$$

Fuel Consumption Rates A and B are the gallons per 1,000 ton-mile of the conventional and advanced vehicles, respectively, as measured under the test procedures specified by EPA.

GEM Fuel Consumption Result B is the estimated gallons per 1,000 ton-mile rate resulting from emission modeling of the advanced vehicle as specified in 40 CFR 1037.520 and § 535.6(b).

(4) Calculate the benefit in credits using the equation in paragraph (c)(11) of this section and replacing the term (Std-FEL) with the benefit.

(B) For electric vehicles calculate the fuel consumption credits using an FEL of 0 g/1000ton-mile.

(ii) *Heavy-duty engines.* (A) This section specifies how to generate advanced technology-specific fuel consumption credits for hybrid powertrains that include energy storage systems and regenerative braking (including regenerative engine braking) and for engines that include Rankine-cycle (or other bottoming cycle) exhaust energy recovery systems.

(1) Pre-transmission hybrid powertrains are those engine systems that include features that recover and store energy during engine motoring operation but not from the vehicle wheels. These powertrains are tested using the hybrid engine test procedures of 40 CFR part 1065 or using the post-transmission test procedures.

(2) Post-transmission hybrid powertrains are those powertrains that include features that recover and store energy from braking at the vehicle wheels. These powertrains are tested by simulating the chassis test procedure applicable for hybrid vehicles under 40 CFR 1037.550.

(3) Test engines that include Rankine-cycle exhaust energy recovery systems according to the test procedures specified in 40 CFR part 1036, subpart F, unless EPA approves the manufacturer's alternate procedures.

(B) Calculate credits as specified in paragraph (c) of this section. Credits generated from engines and powertrains certified under this section may be used in other averaging sets as described in 40 CFR 1036.740(d).

(2) *Innovative technology credits.* This provision allows engine and vehicle manufacturers to generate CO₂ emission credits consistent with the provisions of 40 CFR 1036.610 (for engines), 40 CFR 1037.104(d)(13) (for heavy-duty pickup trucks and vans) and 40 CFR 1037.610 (for vocational vehicles and tractors) for introducing innovative technology in heavy-duty engines and vehicles for reducing greenhouse gas emissions and fuel consumption. Upon identification and approval from EPA of a manufacturer seeking to obtain innovative technology credits in a given model year, NHTSA may adopt an equivalent amount of fuel consumption credits into its program. Such credits must remain within the same regulatory subcategory in which the credits were generated. NHTSA will adopt these fuel consumption credits depending upon whether:

(i) The technology has a direct impact upon reducing fuel consumption performance;

(ii) The manufacturer has provided sufficient information to make sound engineering judgments on the impact of the technology in reducing fuel consumption performance; and

(iii) Credits will be accepted on a one-for-one basis expressed in terms of gallons.

§ 535.8 Reporting requirements.

(a) *General requirements.* Manufacturers producing heavy-duty vehicles and engines applicable to fuel consumption standards in § 535.5, for each given model year, must submit the required information as specified in paragraphs (b) through (h) of this section.

(1) The information required by this part must be submitted by the deadlines specified in this section and must be based upon all the information and data available to the manufacturer 30 days before submitting information.

(2) Manufacturers must submit information electronically through the EPA database system as the single point of entry for all information required for this national program and both agencies will have access to the information. The format for the required information is specified by EPA.

(3) If by model year 2012 the agencies are not prepared to receive information

through the EPA database system, manufacturers are required to submit information to EPA using an approved information format. A manufacturer can use a different format, if it sends EPA a written request with justification for a waiver.

(b) *Pre-model year reports.* Manufacturers producing heavy-duty pickup trucks and vans must submit reports in advance of the model year providing early estimates demonstrating how their fleet(s) would comply with GHG emissions and fuel consumption standards. Note, the agencies understand that early model year reports contain estimates that may change over the course of a model year and that compliance information manufacturers submit prior to the beginning of a new model year may not represent the final compliance outcome. The agencies view the necessity for requiring early model reports as a manufacturer's good faith projection for demonstrating compliance with emission and fuel consumption standards.

(1) *Report deadlines.* For model years 2013 and later, manufacturer of heavy-duty pickup trucks and vans complying with voluntary and mandatory standards must submit a pre-model year report for the given model year as early as the date of the manufacturer's annual certification preview meeting with EPA and NHTSA, or prior to submitting its first application for a certificate of conformity to EPA in accordance with 40 CFR 1037.104(d). For example, a manufacturer choosing to comply in model year 2014 could submit its pre-model year report during its precertification meeting which could occur before January 2, 2013, or could provide its pre-model year report any time prior to submitting its first application for certification for the given model year.

(2) *Contents.* Each pre-model year report must be submitted including the following information for each model year.

(i) A list of each unique subconfiguration in the manufacturer's fleet describing the make and model designations, attribute based-values (*i.e.*, GVWR, GCWR, Curb Weight and drive configurations) and standards;

(ii) The emission and fuel consumption fleet average standard derived from the unique vehicle configurations;

(iii) The estimated vehicle configuration, test group and fleet production volumes;

(iv) The expected emissions and fuel consumption test group results and fleet average performance;

(v) If complying with MY 2013 fuel consumption standards, a statement must be provided declaring that the manufacturer is voluntarily choosing to comply early with the EPA and NHTSA programs. The manufacturers must also acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years for all the vehicles it manufactures in each regulatory category for a given model year;

(vi) If complying with MYs 2014, 2015 or 2016 fuel consumption standards, a statement must be provided declaring whether the manufacturer will use fixed or increasing standards in accordance with § 535.5(a). The manufacturer must also acknowledge that once selected, the decision cannot be reversed and the manufacturer must continue to comply with the same alternative for subsequent model years for all the vehicles it manufactures in each regulatory category for a given model year;

(vii) If complying with MYs 2014 or 2015 fuel consumption standards, a statement must be provided declaring that the manufacturer is voluntarily choosing to comply with NHTSA's voluntary fuel consumption standards in accordance with § 535.5(a)(4). The manufacturers must also acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years for all the vehicles it manufactures in each regulatory category for a given model year;

(viii) The list of Class 2b and 3 incomplete vehicles (cab-complete or chassis complete vehicles) and the method used to certify these vehicles as complete pickups and vans identifying the most similar complete sister- or other complete vehicles used to derive the

target standards and performance test results;

(ix) The list of Class 4 and 5 incomplete and complete vehicles and the method use to certify these vehicles as complete pickups and vans identifying the most similar complete or sister vehicles used to derive the target standards and performance test results;

(x) List of loose engines included in the heavy-duty pickup and van category and the list of vehicles used to derive target standards and performance test results;

(xi) Copy of any notices a vehicle manufacturer sends to the engine manufacturer to notify the engine manufacturers that their engines are subject to emissions and fuel consumption standards and that it intends to use their engines in excluded vehicles;

(xii) A credit plan identifying the manufacturers estimated credit balances, planned credit flexibilities (*i.e.*, credit balances, planned credit trading, innovative, advanced and early credits and *etc.*) and if needed a credit deficit plan demonstrating how it plans to resolve any credit deficits that might occur for a model year within a period of up to three model years after that deficit has occurred; and

(xiii) The supplemental information specified in paragraph (h) of this section. [Note: NHTSA may also ask a manufacturer to provide additional information if necessary to verify compliance with the fuel consumption requirements of this regulation.]

(c) *Applications for certificate of conformity.* Manufacturers producing vocational vehicles, tractors and heavy-duty engines are required to submit applications for certificates of conformity to EPA in accordance with 40 CFR 1036.205 and 1037.205 in advance of introducing vehicles for commercial sale. Applications contain early model year information demonstrating how manufacturers plan to comply with GHG emissions. For model years 2013 and later, manufacturers of vocational vehicles, tractors and engine complying with NHTSA's voluntary and mandatory standards must submit applications for certificates of conformity in accordance through the EPA database including both GHG

emissions and fuel consumption information for each given model year.

(1) *Submission deadlines.* Applications are primarily submitted in advance of the given model year to EPA but cannot be submitted any later than December 31 of the given model year.

(2) *Contents.* Each application for certificates of conformity submitted to EPA must include the following equivalent fuel consumption.

(i) Equivalent fuel consumption values for emissions CO₂ FCLs values used to certify each engine family in accordance with 40 CFR 1036.205(e). This provision applies only to manufacturers producing heavy-duty engines.

(ii) Equivalent fuel consumption values for emission CO₂ data engines used to comply with emission standards in 40 CFR 1036.108. This provision applies only to manufacturers producing heavy-duty engines.

(iii) Equivalent fuel consumption values for emissions CO₂ FELs values used to certify each vehicle families or sub-families in accordance with 40 CFR 1037.205(k). This provision applies only to manufacturers producing vocational vehicles and tractors.

(iv) Report modeling results for ten configurations in terms of CO₂ emissions and equivalent fuel consumption results in accordance with 40 CFR 1037.205(o). Include modeling inputs and detailed descriptions of how they were derived. This provision applies only to manufacturers producing vocational vehicles and tractors.

(3) *Additional supplemental information.* Manufacturers are required to submit additional information as specified in paragraph (h) of this section for the NHTSA program before or at the same time it submits its first application for a certificate of conformity to EPA. Under limited conditions, NHTSA may also ask a manufacturer to provide additional information directly to the Administrator if necessary to verify the fuel consumption requirements of this regulation.

(d) *End-of-the-year-report.* Both manufacturers participating and not participating in the ABT program are required to submit year end reports; end-of-the-year (EOY) reports in accordance with 40 CFR 1036.730 and 1037.730. The EOY reports are used to review a

manufacturer's preliminary final estimates and to identify manufacturers that might have a credit deficit for the given model year. For model years 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA's voluntary and mandatory standards must submit EOY reports through the EPA database including both GHG emissions and fuel consumption information for each given model year.

(1) *Report deadlines.* For model year 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA voluntary and mandatory standards must submit EOY reports through the EPA database including both GHG emissions and fuel consumption information within 90 days after the end of the given model year and no later than April 1 of the next calendar year. For example, the EOY report for model year 2014 must be submitted no later than April 1, 2015.

(i) If a manufacturer expects differences in the information reported between the EOY and the final year report specified in 40 CFR 1036.730 and 1037.730, it must provide the most up-to-date fuel consumption projections in its EOY report and identify the information as preliminary.

(ii) If the manufacturer cannot provide any of the required fuel consumption information, it must state the specific reason for the insufficiency and identify the additional testing needed or explain what analytical methods are believed by the manufacturer will be necessary to eliminate the insufficiency and certify that the results will be available for the final report.

(2) *Contents.* Each EOY report must be submitted including the following fuel consumption information for each model year.

(i) Engine and vehicle family designations and averaging sets.

(ii) Engine and vehicle regulatory subcategory and fuel consumption standards including any alternative standards used.

(iii) Engine and vehicle family FCLs and FELs in terms of fuel consumption.

(iv) Production volumes for engines and vehicles.

(v) A credit plan (for manufacturers participating in the ABT program) identifying the manufacturers actual fuel consumption credit balances, credit flexibilities, credit trades and a credit deficit plan if needed demonstrating how it plans to resolve any credit deficits that might occur for a model year within a period of up to three model years after that deficit has occurred

(vi) A plan describing the vocational vehicles and vocational tractors that were exempted as heavy-duty off-road vehicles.

(vii) A final plan describing any advanced technology engines or vehicles including alternative fueled vehicles that were produced for the model year identifying the approaches used to determine compliance and the production volumes.

(viii) A final list of each unique subconfiguration included in a manufacturer's fleet of heavy-duty pickup trucks and vans describing the designations, attribute based-values (GVWR, GCWR, Curb Weight and drive configurations) and standards. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(ix) The final fuel consumption fleet average standard derived from the unique vehicle configurations. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(x) The preliminary final subconfiguration and test group production volumes. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(xi) The preliminary final fuel consumption test group results and fleet average performance. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(xii) Under limited conditions, NHTSA may also ask a manufacturer to provide additional information directly to the Administrator if necessary to verify the fuel consumption requirements of this part.

(e) *Final reports.* Both manufacturers participating and not participating in the ABT program are required to submit year end final reports in accordance with 40 CFR 1036.730 and 1037.730.

The final reports are used to review a manufacturer's final data and to identify manufacturers that might have a credit deficit for the given model year. For model years 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA's voluntary and mandatory standards must submit final reports through the EPA database including both GHG emissions and fuel consumption information for each given model year.

(1) *Report deadlines.* For model year 2013 and later, heavy-duty vehicle and engine manufacturers complying with NHTSA voluntary and mandatory standards must submit final reports through the EPA database including both GHG emissions and fuel consumption information within 270 days after the end of the given model year and no later than October 1 of the next calendar year. For example, the final reports for model year 2014 must be submitted no later than October 1, 2015.

(2) *Contents.* Each final report must be submitted including the following fuel consumption information for each model year.

(i) Final engine and vehicle family designations and averaging sets.

(ii) Final engine and vehicle fuel consumption standards including any alternative standards used.

(iii) Final engine and vehicle family FCLs and FELs in terms of fuel consumption.

(iv) Final production volumes for engines and vehicles.

(v) A final credit plan identifying the manufacturers actual fuel consumption credit balances, credit flexibilities, credit trades and a credit deficit plan if needed demonstrating how it plans to resolve any credit deficits that might occur for a model year within a period of up to three model years after that deficit has occurred

(vi) A final plan describing the vocational vehicles and vocational tractors that were exempted as heavy-duty off-road vehicles.

(vii) A final plan describing any advanced technology engines or vehicles including alternative fueled vehicles that were produced for the model year identifying the approaches used to terminate compliance and the production volumes.

(viii) A final list of each unique subconfiguration included in a manufacturer's fleet of heavy-duty pickup trucks and vans describing the designations, attribute based-values (GVWR, GCWR, Curb Weight and drive configurations) and standards. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(ix) The final fuel consumption fleet average standard derived from the unique vehicle configurations. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(x) The final subconfiguration and test group production volumes. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(xi) The final fuel consumption test group results and fleet average performance. This provision applies only to manufacturers producing heavy-duty pickup trucks and vans.

(xii) Under limited conditions, NHTSA may also ask a manufacturer to provide additional information directly to the Administrator if necessary to verify the fuel consumption requirements of this regulation.

(f) *Amendments to applications for certification.* At any time, a manufacturer modifies an application for certification in accordance with 40 CFR 1036.225 and 1037.225, it must submit GHG emissions changes with equivalent fuel consumption values for the information required in paragraphs (b) through (e) and (h) of this section.

(g) *Confidential information.* Manufacturers must submit a request for confidentiality with each electronic submission specifying any part of the for information or data in a report that it believes should be withheld from public disclosure as trade secret or other confidential business information. Information submitted to EPA should follow EPA guidelines for treatment of confidentiality. Confidential information submitted to NHTSA shall be treated according to paragraph (g)(1) of this section. For any information or data requested by the manufacturer to be withheld under 5 U.S.C. 552(b)(4) and 15 U.S.C. 2005(d)(1), the manufacturer

shall provide evidence in its request for confidentiality to justify that:

(1) The item is within the scope of 5 U.S.C. 552(b)(4) and 15 U.S.C. 2005(d)(1);

(2) The disclosure of such an item would result in significant competitive damage;

(3) The period during which the item must be withheld to avoid that damage; and

(4) How earlier disclosure would result in that damage.

(h) *Additional required information.* The following additional information is required to be submitted through the EPA database. NHTSA reserves the right to ask a manufacturer to provide additional information if necessary to verify the fuel consumption requirements of this regulation.

(1) *Small business exemptions.* Vehicles and engines produced by small business manufacturers meeting the criteria in 13 CFR 121.201 are exempted from the requirements of this part. Qualifying small business manufacturers must notify the EPA and NHTSA Administrators before importing or introducing into U.S. commerce exempted vehicles or engines. This notification must include a description of the manufacturer's qualification as a small business under 13 CFR 121.201 and must be submitted to EPA. The agencies may review a manufacturer's qualification as a small business manufacturer under 13 CFR 121.201.

(2) *Early introduction.* The provision applies to manufacturers seeking to comply early with the NHTSA's fuel consumption program prior to model year 2014. The manufacturer must send the request to EPA before submitting its first application for a certificate of conformity.

(3) *NHTSA voluntary compliance model years.* Manufacturers must submit a statement declaring whether the manufacturer chooses to comply voluntarily with NHTSA's fuel consumption standards for model years 2014 through 2015. The manufacturers must acknowledge that once selected, the decision cannot be reversed and the manufacturer will continue to comply with the fuel consumption standards for subsequent model years. The manufacturer must send the statement to EPA before

submitting its first application for a certificate of conformity.

(4) *Alternative engine standards.* Manufacturers choosing to comply with the alternative engine standards must notify EPA and NHTSA of their choice and include in that notification a demonstration that it has exhausted all available credits and credit opportunities. The manufacturer must send the statement to EPA before submitting its EOY report.

(5) *Alternate phase-in.* Manufacturers choosing to comply with the alternative engine phase-in must notify EPA and NHTSA of their choice. The manufacturer must send the statement to EPA before submitting its first application for a certificate of conformity.

(6) *Off-road exclusion (tractors and vocational vehicles only).* (i) Vehicles intended to be used extensively in off-road environments such as forests, oil fields, and construction sites may be exempted without request from the requirements of this regulation as specified in 49 CFR 523.2 and § 535.5(b). Within 90 days after the end of each model year, manufacturers must send EPA and NHTSA through the EPA database a report with the following information:

(A) A description of each excluded vehicle configuration, including an explanation of why it qualifies for this exclusion.

(B) The number of vehicles excluded for each vehicle configuration.

(ii) A manufacturer having an off-road vehicle failing to meet the criteria under the agencies' off-road exclusions will be allowed to submit a petition describing how and why their vehicles should qualify for exclusion. The process of petitioning for an exclusion is explained below. For each request, the manufacturer will be required to describe why it believes an exclusion is warranted and address the following factors which the agencies will consider in granting its petition:

(A) The agencies will provide an exclusion based on off road capability of the vehicle or if the vehicle is fitted with speed restricted tires. A manufacturer should explain which exclusion does its vehicle qualify under; and

(B) A manufacturer should verify if there are any comparable tires that exist in the market to carry out the desired application both on and off road for the subject vehicle(s) of the petition which have LLR values that would enable compliance with the standard.

(7) *Vocational tractor*. Tractors intended to be used as vocational tractors may comply with vocational vehicle standards in § 535.5(b) of this regulation. Manufacturers classifying tractor as vocational tractors must provide a description of how they meet the qualifications in their applications for certificates of conformity as specified in 40 CFR 1037.205.

(8) *Approval of alternate methods to determine drag coefficients (tractors only)*. Manufacturers seeking to use alternative methods to determine aerodynamic drag coefficients must provide a request and gain approval by EPA. The manufacturer must send the request to EPA before submitting its first application for a certificate of conformity.

(9) *Innovative technology credits*. Manufacturers pursuing innovative technology credits must submit information to the agencies and may be subject to a public evaluation process in which the public would have opportunity for comment if not using a test procedure in accordance with 40 CFR 1037.610(c). Whether the approach involves on-road testing, modeling, or some other analytical approach, the manufacturer would be required to present a final methodology to EPA and NHTSA. EPA and NHTSA would approve the methodology and credits only if certain criteria were met. Baseline emissions and fuel consumption and control emissions and fuel consumption would need to be clearly demonstrated over a wide range of real world driving conditions and over a sufficient number of vehicles to address issues of uncertainty with the data. Data would need to be on a vehicle model-specific basis unless a manufacturer demonstrated model-specific data was not necessary. The agencies may publish a notice of availability in the FEDERAL REGISTER notifying the public of a manufacturer's proposed alternative off-cycle credit calculation methodology and provide opportunity for comment. Any notice

will include details regarding the methodology, but not include any Confidential Business Information.

(10) *Credit trades*. If a manufacturer trades fuel consumption credits, it must send EPA a report within 90 days after the transaction, as follows:

(i) As the seller, the manufacturer must include the following information in its report:

(A) The corporate names of the buyer and any brokers.

(B) A copy of any contracts related to the trade.

(C) The fleet, vehicle or engine families that generated fuel consumption credits for the trade, including the number of fuel consumption credits from each family.

(ii) As the buyer, the manufacturer or entity must include the following information in its report:

(A) The corporate names of the seller and any brokers.

(B) A copy of any contracts related to the trade.

(C) How the manufacturer or entity intends to use the fuel consumption credits, including the number of fuel consumption credits it intends to apply to each vehicle family (if known).

(i) *Public information*. Based upon information submitted by manufacturers and EPA, NHTSA will publish fuel consumption standards and performance results.

(j) *Information received from EPA*. NHTSA will receive information from EPA as specified in 40 CFR 1036.755 and 1037.755.

§ 535.9 Enforcement approach.

(a) *Compliance*. (1) NHTSA will assess compliance with fuel consumption standards each year, based upon EPA final verified data submitted to NHTSA for its heavy-duty vehicle fuel efficiency program established pursuant to 49 U.S.C. 32902(k). NHTSA may conduct verification testing throughout a given model year in order to validate data received from manufacturers and will discuss any potential issues with EPA and the manufacturer.

(2) Credit values in gallons are calculated based on the final CO₂ emissions and fuel consumption data submitted by manufacturers and verified/validated by EPA.